

AN ECOLOGICAL CHARACTERIZATION STUDY OF THE CHENIER PLAIN COASTAL ECOSYSTEM OF LOUISIANA AND TEXAS was prepared for the National Coastal Ecosystems Team, Office of Biological Services, U.S. Fish and Wildlife Service. James G. Gosselink, Louisiana State University, was principal investigator. Funding was provided by the Office of Research and Development, U.S. Environmental Protection Agency.

Copies of Volume I (Narrative Report) FWS/OBS-78/9, Volume II (Data Source Appendix) FWS/OBS-78/10, and Volume III (Atlas) FWS/OBS-78/11, may be obtained from:

National Coastal Ecosystems Team
U.S. Fish and Wildlife Service
NASA-Slidell Computer Complex
1010 Gause Blvd.
Slidell, LA 70458

Contents of Volume III

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- 3A and 3B — Chenier Plain Habitat Groups
- 4A and 4B — Chenier Plain Wetland Habitats
- 5A and 5B — Canal and Point Source Discharges
- 6A and 6B — Special Features

The Biological Services Program was established within the U.S. Fish and Wildlife Service to supply scientific information and methodologies on key environmental issues that impact fish and wildlife resources and their supporting ecosystems. The mission of the program is as follows:

- To strengthen the Fish and Wildlife Service in its role as a primary source of information on national fish and wildlife resources, particularly in respect to environmental impact assessment.
- To gather, analyze, and present information that will aid decisionmakers in the identification and resolution of problems associated with major changes in land and water use.
- To provide better ecological information and evaluation for Department of the Interior development programs, such as those relating to energy development.

Information developed by the Biological Services Program is intended for use in the planning and decisionmaking process to prevent or minimize the impact of development on fish and wildlife. Research activities and technical assistance services are based on analysis of the issues, a determination of the decisionmakers involved and their information needs, and an evaluation of the state of the art to identify information gaps and determine priorities. This is a strategy that will ensure that the products produced are disseminated are timely and useful.

Projects have been initiated in the following areas: coal extraction and conversion; power plants, geothermal, mineral, and oil-shale development; water resource analysis, including stream alterations and western water allocation; coastal ecosystems and Outer Continental Shelf development; and systems inventory, including National Wetland Inventory, habitat classification and analysis, and information transfer.

The Biological Services Program consists of the Office of Biological Services in Washington, D.C., which is responsible for overall planning and management; National Teams, which provide the Program's central scientific and technical expertise and arrange for contracting biological services studies with states, universities, consulting firms, and others; Regional Staff, who provide a link to problems at the operating level; and staff at certain Fish and Wildlife Service research facilities, who conduct in-house research studies.

94°45'

94°30'

94°15'

PLATE 1A INDEX MAP

TEXAS LEGEND

STATE BOUNDARY	COUNTY BOUNDARY	UNINCORPORATED TOWN	RAILROAD	RAILROAD STATION	RAILROAD CROSSING	RAILROAD BRIDGE	RAILROAD TUNNEL	RAILROAD CUT	RAILROAD DITCH	RAILROAD EMBANKMENT	RAILROAD GRADE	RAILROAD CUT	RAILROAD DITCH	RAILROAD EMBANKMENT	RAILROAD GRADE
STATE BOUNDARY	COUNTY BOUNDARY	UNINCORPORATED TOWN	RAILROAD	RAILROAD STATION	RAILROAD CROSSING	RAILROAD BRIDGE	RAILROAD TUNNEL	RAILROAD CUT	RAILROAD DITCH	RAILROAD EMBANKMENT	RAILROAD GRADE	RAILROAD CUT	RAILROAD DITCH	RAILROAD EMBANKMENT	RAILROAD GRADE

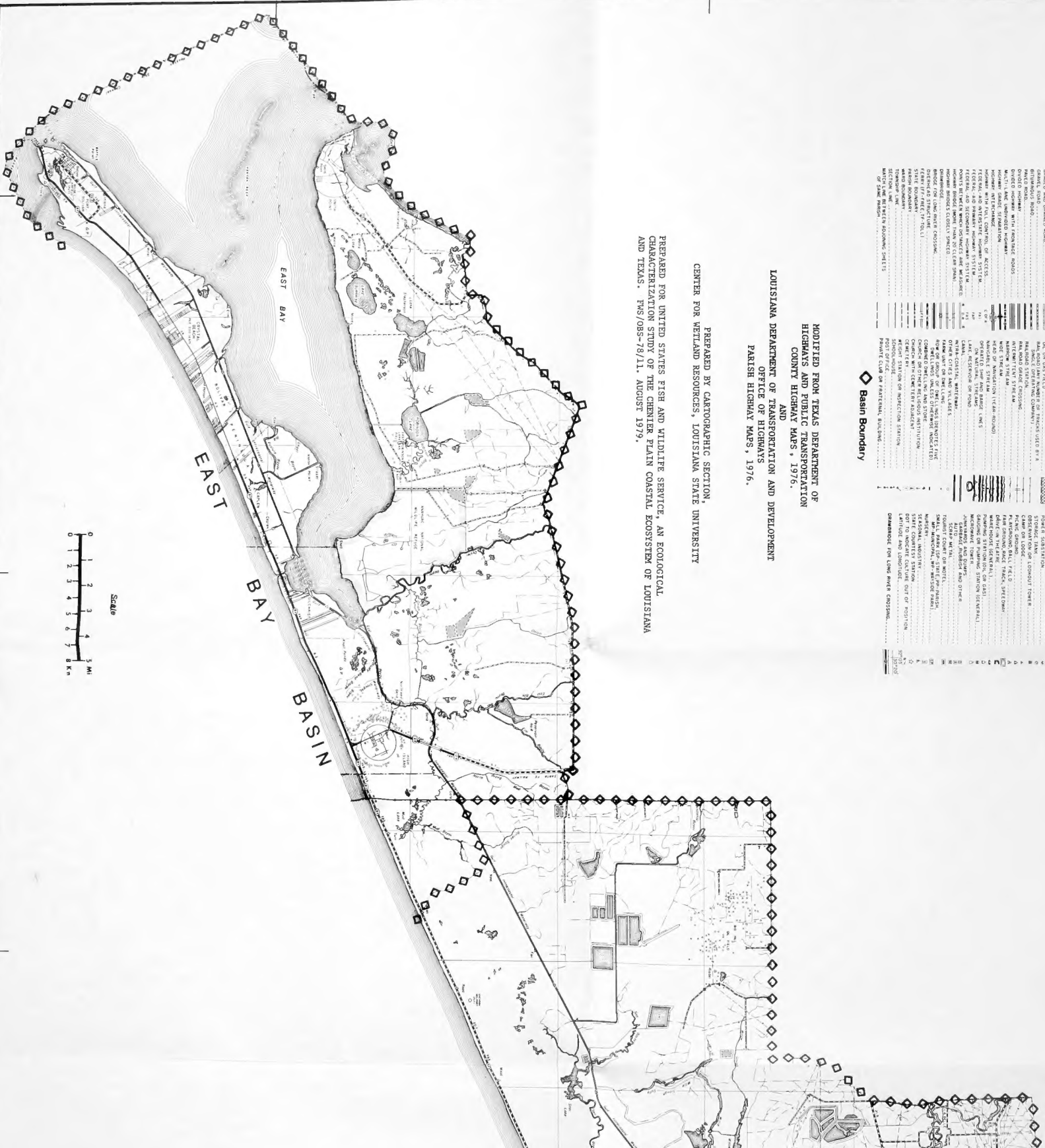
LOUISIANA LEGEND

STATE BOUNDARY	COUNTY BOUNDARY	UNINCORPORATED TOWN	RAILROAD	RAILROAD STATION	RAILROAD CROSSING	RAILROAD BRIDGE	RAILROAD TUNNEL	RAILROAD CUT	RAILROAD DITCH	RAILROAD EMBANKMENT	RAILROAD GRADE	RAILROAD CUT	RAILROAD DITCH	RAILROAD EMBANKMENT	RAILROAD GRADE
STATE BOUNDARY	COUNTY BOUNDARY	UNINCORPORATED TOWN	RAILROAD	RAILROAD STATION	RAILROAD CROSSING	RAILROAD BRIDGE	RAILROAD TUNNEL	RAILROAD CUT	RAILROAD DITCH	RAILROAD EMBANKMENT	RAILROAD GRADE	RAILROAD CUT	RAILROAD DITCH	RAILROAD EMBANKMENT	RAILROAD GRADE

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
MODIFIED FROM TEXAS DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION
COUNTY HIGHWAY MAPS, 1976.
AND
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
OFFICE OF HIGHWAYS
PARISH HIGHWAY MAPS, 1976.

PREPARED BY CARTOGRAPHIC SECTION,
CENTER FOR WETLAND RESOURCES, LOUISIANA STATE UNIVERSITY

PREPARED FOR UNITED STATES FISH AND WILDLIFE SERVICE, AN ECOLOGICAL
CHARACTERIZATION STUDY OF THE CHENIERE PLAIN COASTAL ECOSYSTEM OF LOUISIANA
AND TEXAS. FWS/OBS-78/11, AUGUST 1979.





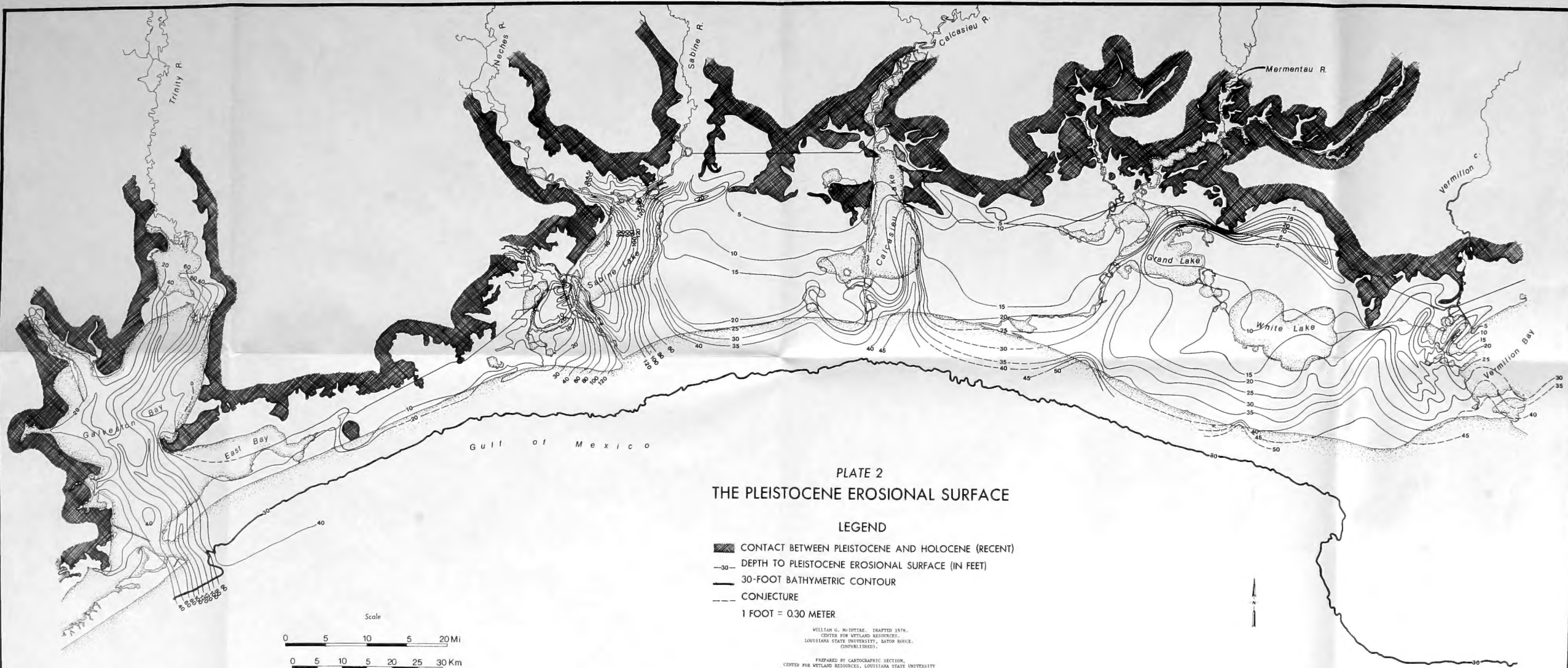


PLATE 2 THE PLEISTOCENE EROSIONAL SURFACE

LEGEND

- CONTACT BETWEEN PLEISTOCENE AND HOLOCENE (RECENT)
- DEPTH TO PLEISTOCENE EROSIONAL SURFACE (IN FEET)
- 30-FOOT BATHYMETRIC CONTOUR
- CONJECTURE
- 1 FOOT = 0.30 METER







WILLIAM G. MONTGOMERY, DRAFTED 1976.
COURTESY OF WETLAND RESOURCES,
LOUISIANA STATE UNIVERSITY, BATON ROUGE.
(UNPUBLISHED).

PREPARED BY CARTOGRAPHIC SECTION,
COURTESY OF WETLAND RESOURCES, LOUISIANA STATE UNIVERSITY

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CHARACTERIZATION STUDY OF THE CHESAPEAKE PLAIN COASTAL ECOSYSTEM OF LOUISIANA
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PLATE 3A CHENIER PLAIN HABITAT GROUPS

LEGEND

-  AQUATIC - permanently flooded, non-vegetated inland open water and nearshore Gulf habitats.
-  WETLANDS - periodically flooded lands characterized by emergent vegetation. See Plate 4
-  AGRICULTURE - cultivated cropland and improved pasture.
-  RIDGES AND UPLAND FOREST - naturally vegetated cheniers, levees, spoil banks, Pleistocene islands, and prairie surface.
-  URBAN - land areas developed for residential and industrial use.
-  BASIN BOUNDARY

PREPARED FROM UNITED STATES GEOLOGICAL SURVEY 1974-75, 1:125,000
ORTHOPHOTO QUADRANGLES, ADVANCED EDITION
NASA HIGH ALTITUDE FALSE COLOR INFRARED PHOTOGRAPH
MISSION 2B9 WELD 7, 1974.









PREPARED BY CARTOGRAPHIC SECTION,
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CHARACTERIZATION STUDY OF THE CHENIER PLAIN COASTAL ECOSYSTEM OF
LOUISIANA AND TEXAS. FWS/OBS-78/11, AUGUST 1979.



PLATE 4A CHENIER PLAIN WETLAND HABITATS

LEGEND

-  NON-WETLAND HABITATS
-  SALT MARSH -saline intertidal marshes and associated small ponds, dominated by smooth cordgrass (*Spartina alterniflora*), with saltgrass (*Distichlis spicata*) and blackrush (*Juncus roemerianus*) common.
-  BRACKISH MARSH -intertidal marshes and associated small ponds dominated by saltmeadow cordgrass (*Spartina patens*) and saltgrass; salinities generally less than 10 ‰
-  INTERMEDIATE MARSH -marshes and associated small ponds, periodically flooded with nearly fresh water, but occasionally by brackish water. Dominated by saltmeadow cordgrass, bulltongue (*Sagittaria falcata*), and seashore paspalum (*Paspalum vaginatum*).
-  FRESH MARSH -marshes flooded by fresh water, and with a diverse flora dominated by maidencane (*Panicum hemitomon*), bulltongue, and alligatorweed (*Alternanthera philoxeroides*).
-  IMPOUNDED MARSH -marshes surrounded by dikes, spoil banks, or natural levees that modify normal flooding. These exist in saline to fresh areas. They may be permanently flooded or pumped dry, but all are dominated by native emergent wetland vegetation (as opposed to impounded agricultural land).
-  SWAMP FOREST -forested freshwater wetlands with diverse flora dominated by baldcypress (*Taxodium distichum*) and tupelo (*Nyssa aquatica*).
-  BASIN BOUNDARY

PREPARED FROM UNITED STATES GEOLOGICAL SURVEY 1974-75, 1:24,000
ORTHOPHOTO QUADRANGLES, ADVANCED PRINTS.

CHAPPEL, R. 1972. VEGETATION, WATER AND SOIL
CHARACTERISTICS OF THE LOUISIANA COASTAL REGION.
LOUISIANA AGRICULTURAL EXPERIMENT STATION BULLETIN 664.
FINER, M. L., J. H. ROYCE, L. F. BROWN, JR., AND
CHRY, C. G. 1972. ENVIRONMENTAL GEOLOGIC ATLAS OF
THE TEXAS COASTAL ZONE, GALVESTON-HOUSTON AREA.
BUREAU OF ECONOMIC GEOLOGY, UNIVERSITY OF TEXAS AT
AUSTIN.

_____, 1973. ENVIRONMENTAL GEOLOGIC ATLAS OF THE
TEXAS COASTAL ZONE, BEAUMONT-PORT ARTHUR AREA.
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LOUISIANA AND TEXAS. FWS/OBS-78/13. AUGUST 1979.

East Bay

EAST BAY BASIN

Scale
0 1 2 3 4 5 Mi
0 1 2 3 4 5 6 7 8 Km

94°30'

94°15'

94°00'

93°45'

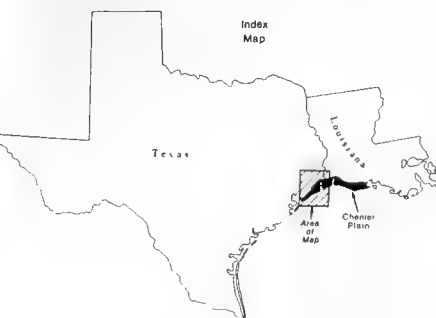
93°30'

29°30'

29°45'

30°00'

SABINE RIVER BASIN



Index
Map

Texas

Louisiana

Area
of
Map

Chenier
Plain

PLATE 5A CANALS AND POINT SOURCE DISCHARGES LEGEND

- INDUSTRIAL AND MUNICIPAL
POINT SOURCE DISCHARGES**
- ① GULF OIL CO.-PORT ARTHUR REFINERY
 - ② TEXACO INC.-PORT ARTHUR PLANT
 - ③ JEFFERSON CHEMICAL CO. INC.-PORT NECHES PLANT
 - ④ NECHES BUTANE
 - ⑤ TEXACO INC.-PORT NECHES
 - ⑥ AMERIPOL INC.
 - ⑦ PURE OIL CO.-BEAUMONT REFINERY
 - ⑧ GULF STATES UTIL CO.-SABINE POWER STATION
 - ⑨ BRITISH PETROLEUM CORP.-PORT ARTHUR REFINERY
 - ⑩ JEFFERSON COUNTY-FWSDI
 - ⑪ PORT ARTHUR-MAIN PLANT
 - ⑫ PORT ARTHUR-LAKESIDE PARK
 - ⑬ GROVES, CITY OF -SOUTH PLANT
 - ⑭ GROVES, CITY OF -NORTH PLANT
 - ⑮ PORT NECHES
 - ⑯ JEFFERSON COUNTY WCID9-EAST PORT NECHES

 CANALS

PREPARED FROM UNITED STATES GEOLOGICAL SURVEY 1974-75 1:24,000
ORTHOPHOTO QUADRANGLES, ADVANCED PRINTS.
UNITED STATES GEOLOGICAL SURVEY LATEST EDITION 1:24,000 AND 1:62,500
TOPOGRAPHIC MAPS, 1974-75.
UNITED STATES ARMY CORPS OF ENGINEERS 1969 UNCONTROLLED PHOTOGRAPHICS
LOUISIANA DEPARTMENT OF PUBLIC WORKS FIELD DATA
POINT SOURCE DISCHARGES.
BINDER, S.A., 1975, COOPERATIVE OIL & MINERAL ESTUARINE INVENTORY
AND STUDY - TEXAS. AREA DESCRIPTION. U.S. DEPARTMENT OF COMMERCE,
NOAA. TECH. REPT. NOS. CIRC-393, SEATTLE, WASH. 129 P.

PREPARED BY CARTOGRAPHIC SECTION,
CENTER FOR WETLAND RESOURCES, LOUISIANA STATE UNIVERSITY
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LOUISIANA AND TEXAS. FWS/OBS-78/11, AUGUST 1978.

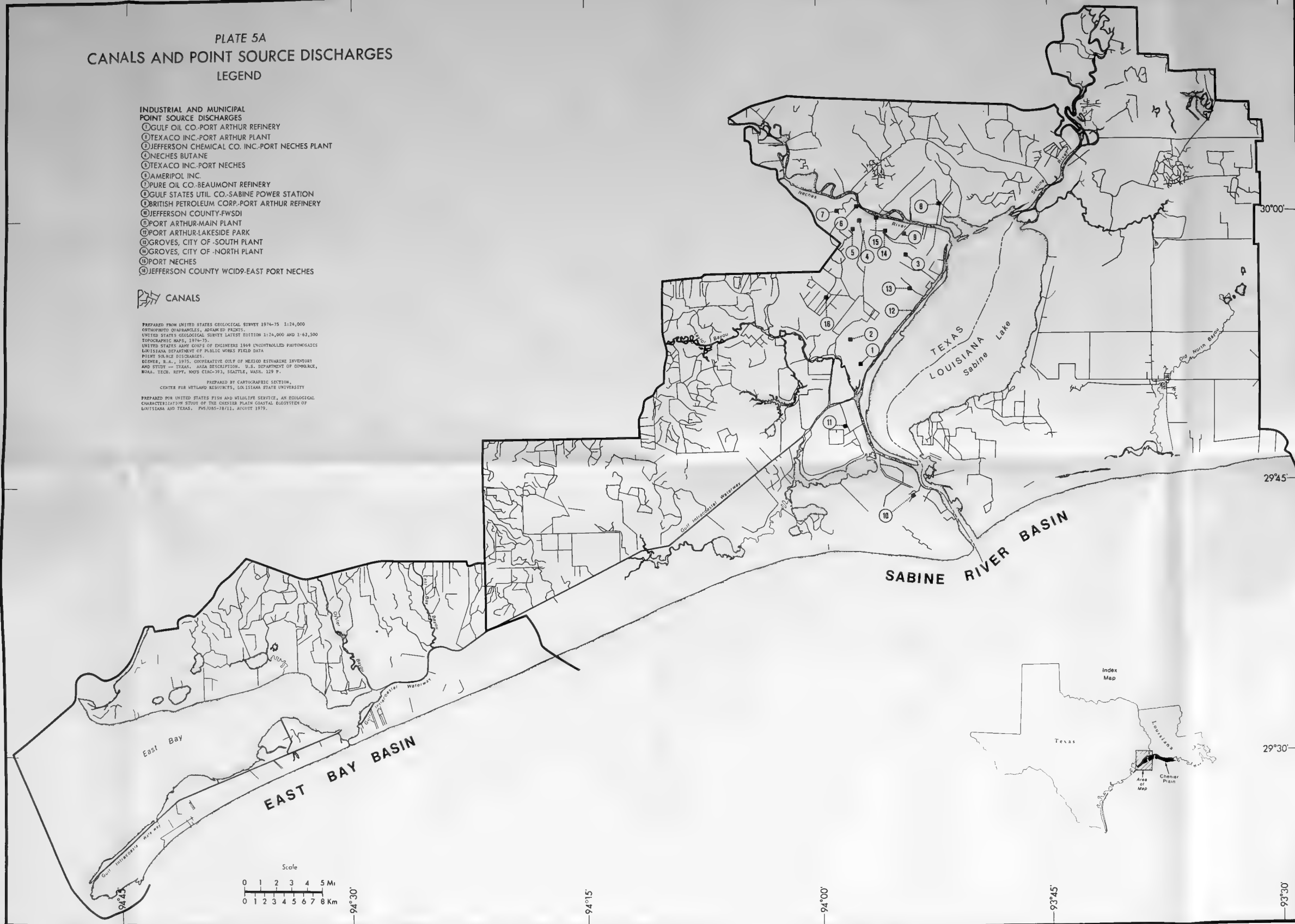


PLATE 6A
SPECIAL FEATURES

LEGEND

- ²¹ ARCHEOLOGICAL SITES
- ▲^c BIRD NESTING COLONIES
- ☐ OYSTER REEFS

ARCHAEOLOGICAL SITES PREPARED FROM DATA SUPPLIED BY
NEWMAN, H. W., CURATOR, LOUISIANA STATE UNIVERSITY
GROESBECK MUSEUM, ARCHAEOLOGICAL SITES IN COASTAL
LOUISIANA.
SPOCK, C., TEXAS ARCHAEOLOGICAL RESEARCH LABORATORY
UNIVERSITY OF TEXAS AT AUSTIN.

BIRD NESTING COLONY DATA TAKEN FROM THE TEXAS COASTAL
WATER BIRD CENSUS, 1973-1976. TEXAS PARKS AND WILDLIFE
DEPARTMENT, 1978. FA REP. SR. 13. AND PORTMAN, J.W.
1977. NESTING COLONIES OF SEABIRDS AND WADING BIRDS,
COASTAL LOUISIANA, MISSISSIPPI AND ALABAMA. U.S. FISH
AND WILDLIFE SERVICE. FWS/OBS = 77/07.

OSTER REEF LOCATIONS FROM LOUISIANA WILDLIFE AND FISHERIES, TEXAS PARKS AND RECREATION, AND DIENER, B.A. 1975. COOPERATIVE GULF OF MEXICO ESTUARINE INVENTORY AND STUDY -- TEXAS: AREA DESCRIPTION. U.S. DEPARTMENT OF COMMERCE, NOAA TECH. REPT. NPS-393, SEATTLE, WASH. 98011.

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RESEARCHES, LOUISIANA STATE UNIVERSITY

PREPARED FOR UNITED STATES FISH AND WILDLIFE SERVICE,
ECOLOGICAL CHARACTERIZATION STUDY OF THE CHENIER PLAIN
COASTAL ECOSYSTEM OF LOUISIANA AND TEXAS.
NOVEMBER 1982

POPULATIONS OF BIRD NESTING COLONIES

COLONY	SPICES PRESENT	EST. PERCENTAGE	COMMON AND SCIENTIFIC NAME
A	Basil & all-spice	20	Asiatic (V. <i>officinalis</i>)
	Peppermint & clove	20	
	Peppermint & nutmeg & light sage	20	
	Peppermint & nutmeg	20	
	Cinnamon & clove	20	
	Peppermint & nutmeg	20	
	Light sage & nutmeg	20	
	Peppermint & nutmeg	20	
	Peppermint & nutmeg	20	
	Peppermint & nutmeg	20	
C	Basil & all-spice	180	
	Peppermint & clove	180	
	Peppermint & nutmeg & light sage	180	
	Peppermint & nutmeg	180	
	Cinnamon & clove	180	
	Peppermint & nutmeg	180	
	Light sage & nutmeg	180	
	Peppermint & nutmeg	180	
	Peppermint & nutmeg	180	
	Peppermint & nutmeg	180	
E	Basil & all-spice	120	
	Peppermint & clove	120	
	Peppermint & nutmeg & light sage	120	
	Peppermint & nutmeg	120	
	Cinnamon & clove	120	
	Peppermint & nutmeg	120	
	Light sage & nutmeg	120	
	Peppermint & nutmeg	120	
	Peppermint & nutmeg	120	
	Peppermint & nutmeg	120	
G	Basil & all-spice	200	
	Peppermint & clove	200	
	Peppermint & nutmeg & light sage	200	
	Peppermint & nutmeg	200	
	Cinnamon & clove	200	
	Peppermint & nutmeg	200	
	Light sage & nutmeg	200	
	Peppermint & nutmeg	200	
	Peppermint & nutmeg	200	
	Peppermint & nutmeg	200	
H	Basil & all-spice	800	
	Peppermint & clove	800	
	Peppermint & nutmeg & light sage	800	
	Peppermint & nutmeg	800	
	Cinnamon & clove	800	
	Peppermint & nutmeg	800	
	Light sage & nutmeg	800	
	Peppermint & nutmeg	800	
	Peppermint & nutmeg	800	
	Peppermint & nutmeg	800	
J	Basil & all-spice	112	
	Peppermint & clove	112	
	Peppermint & nutmeg & light sage	112	
	Peppermint & nutmeg	112	
	Cinnamon & clove	112	
	Peppermint & nutmeg	112	
	Light sage & nutmeg	112	
	Peppermint & nutmeg	112	
	Peppermint & nutmeg	112	
	Peppermint & nutmeg	112	

*Zero indicates that species were present during previous censuses but not during the 1976 post-fire census.

ARCHEOLOGICAL SITE

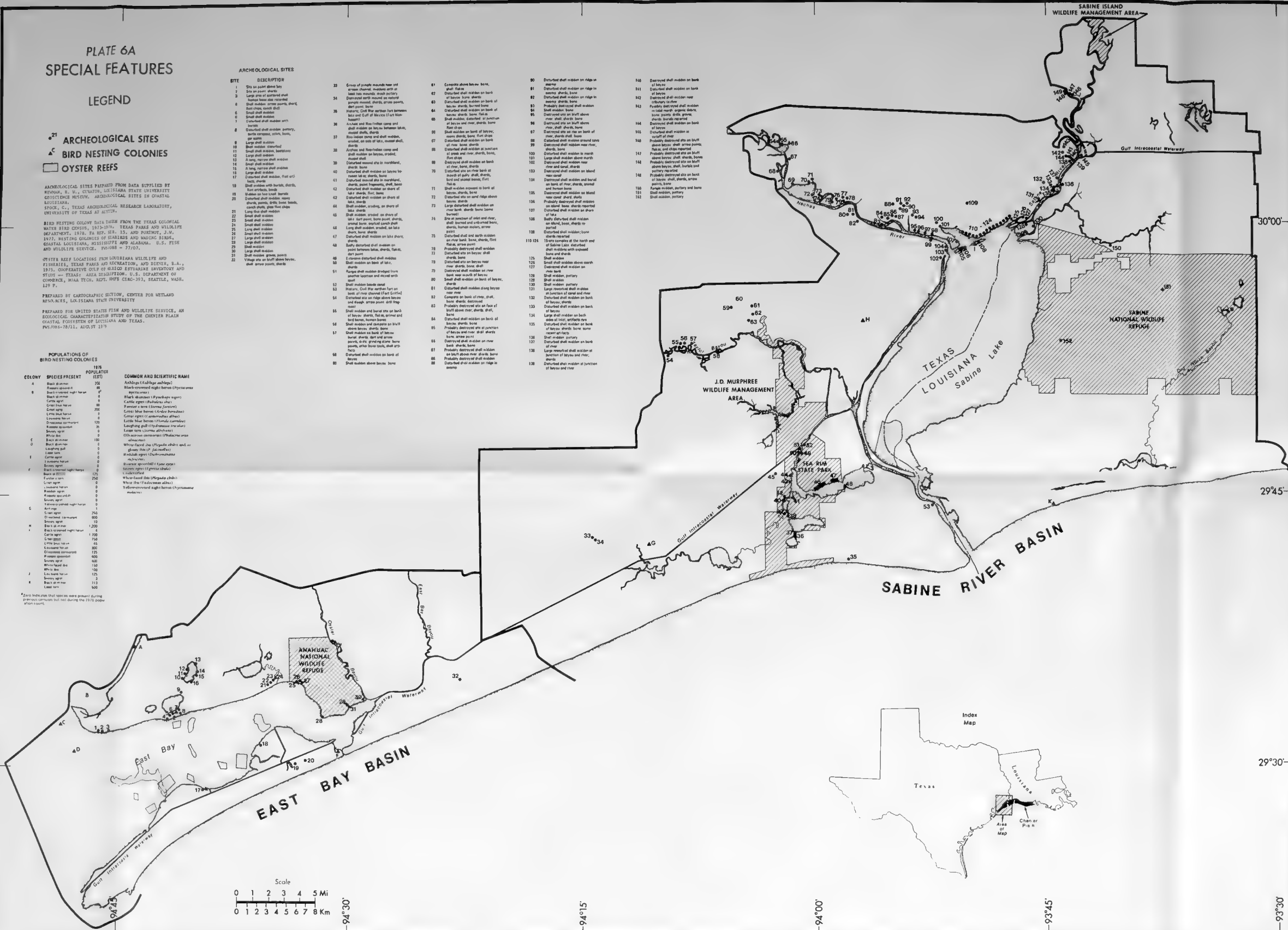






[illegible]

PLATE 3B CHENIER PLAIN HABITAT GROUPS

LEGEND

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-  **URBAN** -land areas developed for residential and industrial use.
-  **Basin Boundary**









PREPARED FROM UNITED STATES GEOLOGICAL SURVEY 1974-75, 1:24,000
ORTHOPHOTO QUADRANGLES, ADVANCED PRINTS.
NASA HIGH ALTITUDE FALSE COLOR INFRARED PHOTOGRAPHY
MISSION 249 JULY 7, 1974.

PREPARED BY CARTOGRAPHIC SECTION,
CENTER FOR WETLAND RESOURCES, LOUISIANA STATE UNIVERSITY

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AND TEXAS. PROJECT/8/11, AUGUST 1979.



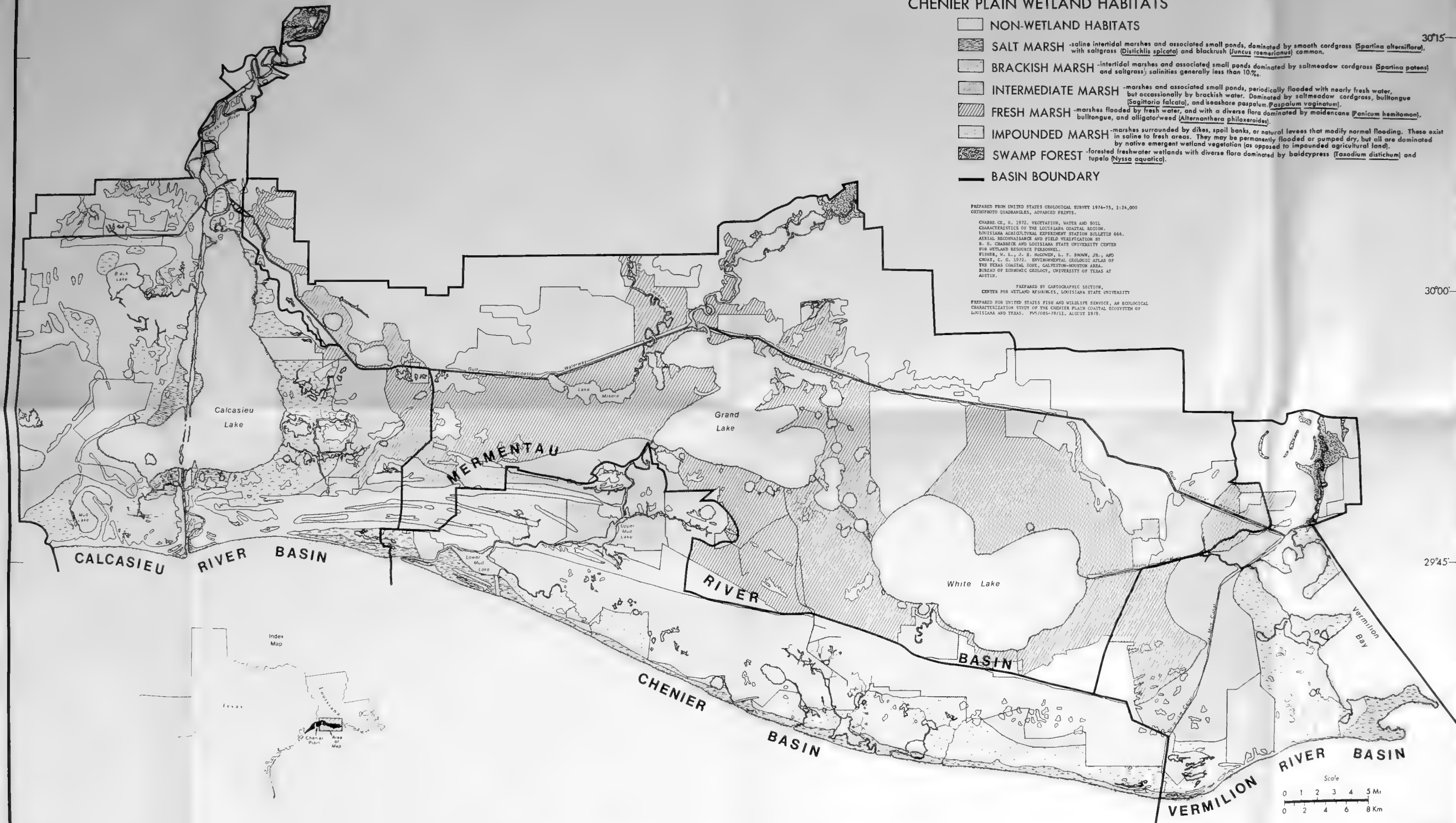
CHENIER PLAIN WETLAND HABITATS

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-  BASIN BOUNDARY

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 PHOTOGRAPHIC QUADRANGLES, ADVANCED FILMS.
 CHABRE, C. R. 1972. VEGETATION, WATER AND SOIL
 CHARACTERISTICS OF THE LOUISIANA COASTAL REGION.
 LOUISIANA AGRICULTURAL EXPERIMENT STATION BULLETIN 664.
 AERIAL RECONNAISSANCE AND FIELD VERIFICATION BY
 R. B. CHABRE AND LOUISIANA STATE UNIVERSITY CENTER
 FOR WETLAND RESOURCE PERSONNEL.
 FISHER, W. L., J. H. MOONEN, L. P. BROWN, JR., AND
 CHART, C. C. 1972. ENVIRONMENTAL GEOLOGIC ATLAS OF
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Scale
 0 1 2 3 4 5 Mi
 0 2 4 6 8 Km

PLATE 5B
CANALS AND POINT SOURCE DISCHARGES
LEGEND

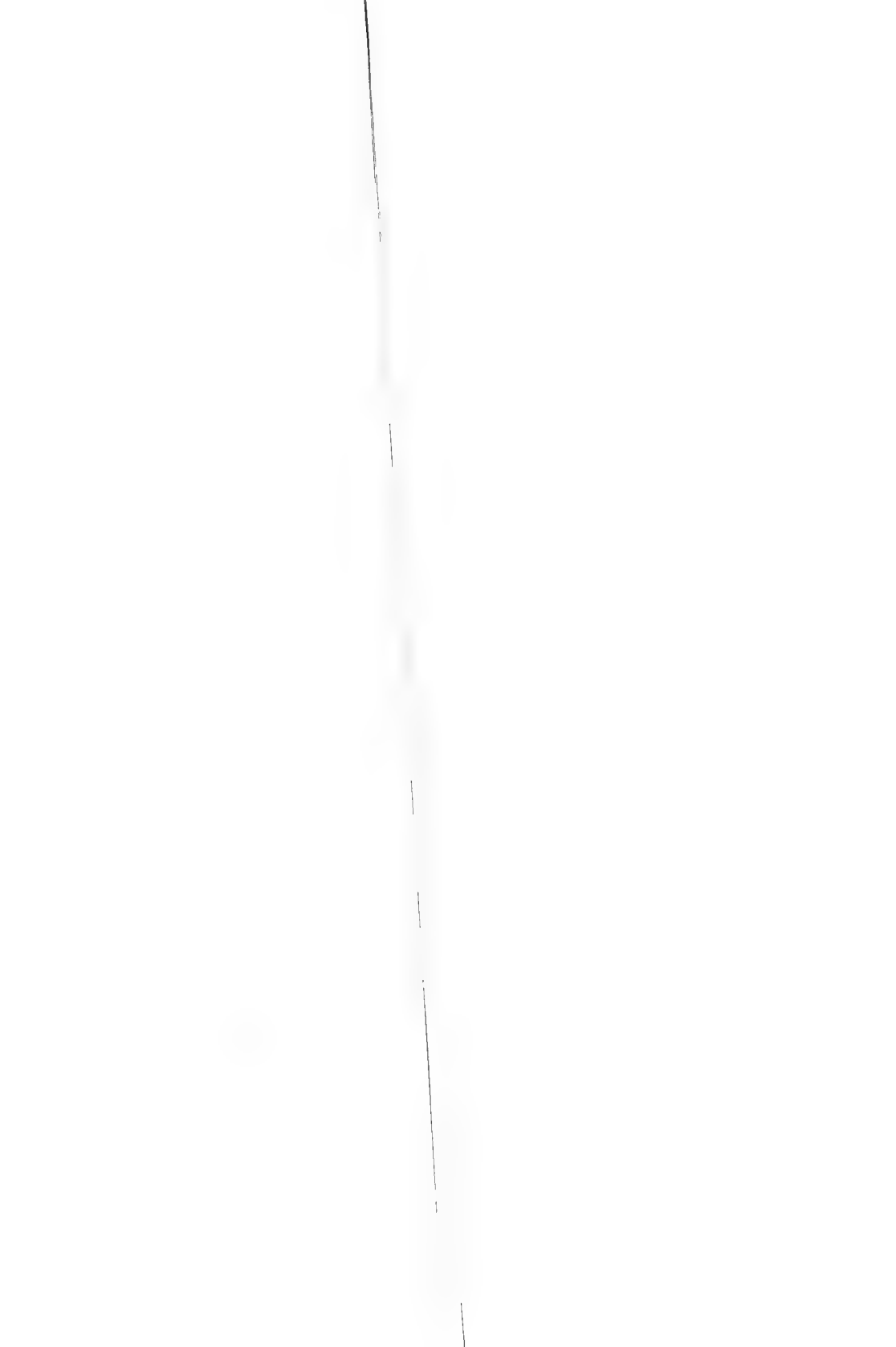
INDUSTRIAL AND MUNICIPAL
POINT SOURCE DISCHARGES
① AMOCO PROD. CO.
② GULF PROD. CO.
③ STEED FISH CO.
④ ZAPATA PROTEIN
⑤ GULF MENHADEN CO.
⑥ LOUISIANA MENHADEN CO.
⑦ HUNT OIL CO.
⑧ AMOCO PROD. CO.
⑨ TEXAS PACIFIC OIL-CRUDE PROD.
⑩ AMOCO PROD. CO.
⑪ OLIN CORP.-BRINE PROD.
⑫ SHELL OIL-CRUDE PROD.
⑬ AMOCO PROD. CO.
⑭ TEXACO WELLS
⑮ AMOCO PROD. CO.
⑯ GULF OIL WELLS
⑰ AMOCO PROD. CO.

⑱ GULF COAST ALUMINUM
⑲ W. R. GRACE INC.
⑳ PPG INDUSTRIES
㉑ CITIES SERVICE POWERHOUSE
㉒ HERCULES INC.
㉓ CERTAIN-TEED INC.
㉔ BIG THREE IND.
㉕ MOBIL OIL WELLS
㉖ CONTINENTAL CARBON
㉗ KCS RAILWAY
㉘ IDEAL CEMENT
㉙ PPG INDUSTRIES
㉚ DRESSER INC.
㉛ CONT. OIL REFINERY
㉜ SERVICE ICE CO.
㉝ OLIN CORP.

㉞ LAKE CHARLES-B&C
㉟ HOLLYWOOD
㊱ WEST LAKE
㊲ LAKE CHARLES-A
㊳ LOUISIANA MUD CO. INC.
㊴ DRESSER MAGCOBAR
㊵ TENNESSEE GAS PIPELINE CO.
㊶ CONTINENTAL OIL CO.
㊷ AMOCO PRODUCTION CO.
㊸ AMOCO PRODUCTION CO.
㊹ TEXACO INC.
㊺ SEA COAST PRODUCTS
㊻ PHILLIPS PETROLEUM CO.
㊼ SHELL OIL CO.
㊽ SUPERIOR OIL CO.-LOWRY GAS PLANT
㊾ AMOCO PRODUCTION CO.



PREPARED FROM UNITED STATES GEOLOGICAL SURVEY 1974-75 1:24,000
TOPOGRAPHIC QUADRALES, ADVANCED PAPER
UNITED STATES GEOLOGICAL SURVEY LATEST EDITION 1:24,000 AND 1:62,500
TOPOGRAPHIC MAPS, 1974-75
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INVENTORY AND 1973-74 AREA DESCRIPTION, U.S. DEPT.
OF COMMERCE, NOAA TECH. REPT. 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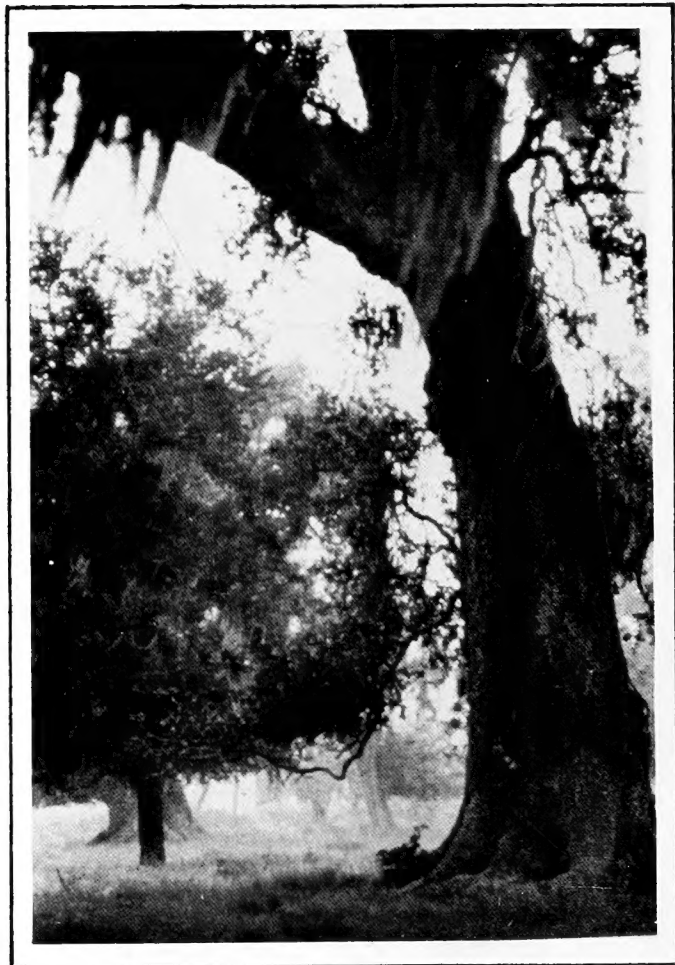
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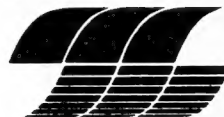
**An Ecological Characterization Study of the
Chenier Plain Coastal Ecosystem of
Louisiana and Texas**

**VOLUME III
ATLAS**



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